BI 121 Lecture 9

I. **Announcements** Lab notebook due today! Lab 4 HR & BP. Thursday, Lab 5 Blood Chemistry. Read 2x pp 5-1 thru 5-6. Q?

II. **Overview of Labs** HR & BP. ♠️Cycle. Blood chem lab review

III. **Cardiovascular Connections** LS 2012 ch 9
    Normal vs abnormal blood flow! Q?

IV. **CV Physiology in the News** NHLBI & AHA websites
    Nicole Kidman & exercise? ACSM, AHA, CDC guidelines

V. **CV Pathophysiology & Risk Reduction** LS ch 9, 10 +…
    A. AMI, CVA, CVD, PVD, TIA, HTN? + surgical treatments
    B. Atherosclerosis? LS fig 9-27, 9-25, 9-26 pp 266-8
    C. How to minimize risk of CVDs? Treatment triad: Exercise, Diet, Drugs + Surgery
    D. Food choices make a difference? What’s HAPOC?
WOW! SUPER 😊
~ TOP 5-10 ~

EXCELLENT!!
~ TOP 15 ~

GREAT EFFORT
~ TOP 20-25 ~
Heart-Blood Pressure Lab Today!

Lub-dup!  I'm cool!
Cardiac Cycle

Systole
Contract & Empty

Diastole
Relax & Fill
Blood Chemistry on Thursday!
No food, drink or gum in lab!

Thanks sincerely!
PREPARATION

1. WASH & DRY

2. ALCOHOL
SAMPLE + TESTS

1. OBTAIN μSAMPL

2. BLOOD GLUCOSE

3. BLOOD TYPING
Glucose: Sugar in Blood

Normal: 70-99
Pre-Diabetes: 100-125
Diabetes: ≥ 126 mg/dL

NB: Read & Record!
BLOOD TYPING

ADD ANTISERA

MIX W/TOOTHPICKS

READ & RECORD!!
CLEAN-UP!

1. FOLD DIAPER
2. BLOOD PRODUCTS
3. REWASH!!
Veins ➔ Atria ➔ Ventricles ➔ Arteries

Superior vena cava (from head)

Right atrium

Inferior vena cava (from body)

Right ventricle

Endocardium

Myocardium

Pericardium

Left atrium

Left ventricle

Aorta

https://www.nhlbi.nih.gov/health-topics/how-heart-works
https://www.youtube.com/watch?v=zJXAlh9VDDU

LS2007
Patent or still open! Foramen ovale!
Patent or still open! Ductus arteriosus!
How much aerobic?

Continuous exercise

≥ 50% muscle mass

≥ Conversational pace

20-60 min/session

3-5 days/wk

Guidelines: Healthy Adults < 65 yr

Do moderately intense aerobic exercise
30 min/d, 5 d/wk

OR

Do vigorously intense aerobic exercise
20 min/d, 3 d/wk

AND

Do 8-10 strength-training exercises
8-12 repetitions/each exercise, 2 d/wk
How much strength?

✔ 2-3 days/wk

✔ 8-10 exercises for major muscle groups

✔ ≥ 1 set/exercise

✔ 8-12 (most) or 10-15 (frail/> 50-60 yr) repetitions/set
AMI
CVDs
CVA
TIA
HTN
PVD
Did you know?

- Every 40 seconds, someone has a heart attack in the US!
- ~630,000 Americans die of heart disease each yr – that’s 1 in every 4 deaths. Heart disease is the leading cause of death for both men and women.
- Heart disease costs the US ~ $200 billion per yr in health care, medications & lost productivity. By 2035, CVD costs are projected to top $1 trillion annually.

Heart Disease Death Rates, 2011-2013
Adults, Ages 35+, by County

Eugene, OR

MN is low!

HI is low!

Jackson, MS

Rate-Adjusted Average Annual Rates per 100,000

Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

Data Source: National Vital Statistics System
National Center for Health Statistics

https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_disease.htm
Coronary Circulation ≡ Crowns the Heart!
FIGURE 9-35
Extent of myocardial damage as a function of the size of the occluded vessel
Treatment Triad

NB: Last blasted resort!!

Drugs/Surgery

Exercise

Dietary Modification
CABG

Coronary Artery Bypass Graft
The graph shows the relationship between the number of cigarettes smoked per day and cardiovascular mortality. The data is presented as an average annual incidence per 1,000.

- **None**: 7
- **Less than 20**: 8.4
- **20**: 10.2
- **More than 20**: 12.4
- **Quit One Year**: 7

**Cigarettes Smoked Per Day**

**Cardiovascular Mortality**

(average annual incidence per 1,000)
Tobacco-free Campus

For better health, smoking and use of tobacco products are prohibited everywhere on our property.

UO's Josh Buehler  U.S. Surgeon General Regina Benjamin

For a healthier community and cleaner environment, the University of Oregon is smoke and tobacco-free.

September 1, 2012

Ready to Quit Tobacco?
Visit tobaccofree.oregon.edu for free and low cost resources.
An LDL to HDL ratio greater than 5 to 1 in men or 4.5 to 1 in women

Increased risk of heart disease
**Apple** type of obesity predisposed to CVD!

*Pear* type of fat pattern...

implies lower disease risk!

CAUTION: HAZARDOUS WAIST

Eat more apples...

to help prevent the apple type of obesity!
HEALTH-RELATED FITNESS

Cardiorespiratory Endurance

Muscular Strength/Endurance

Flexibility

Neuromuscular Relaxation
Pick an abundance of whole grains, legumes, nuts, vegetables & fruits!
Fish Oil Intakes & Cardiovascular Death Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Cardiovascular Deaths per 100,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ireland</td>
<td>0.09%</td>
</tr>
<tr>
<td>USA</td>
<td>0.13%</td>
</tr>
<tr>
<td>France</td>
<td>0.14%</td>
</tr>
<tr>
<td>Japan</td>
<td>0.37%</td>
</tr>
</tbody>
</table>

S&W 2011
fig 5-12 p 167
Healthy Oils to Minimize Atherosclerosis

HAPOC?
Olive Oil Loves Olive Oil & has some heartfelt advise for Popeye!!
Yes for the spinach! — but get rid of the pipe!!
An LDL to HDL ratio of *less than* 5 to 1 in men or 4.5 to 1 in women

*Reduced risk of heart disease*
Before

After